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09/736,736	12/14/2000	Robert Arthur Lee	CU-2418 TFP	8027

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EXAMINER

AMARI, ALESSANDRO V

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 11/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/736,736

Applicant(s)

LEE, ROBERT ARTHUR

Examiner

Alessandro V. Amari

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MW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-10 and 12-20 and 22-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshitake et al US Patent 5,991,078.

In regard to claims 1 and 22, Yoshitake et al. discloses (see Figures 3-5) a diffractive device having a surface relief structure which, when illuminated by a light source, generates one or more diffraction images which are observable from particular ranges of viewing angles around the device as described in column 1, lines 53-68 and column 2, lines 1-57, including: a region of diffractive structural elements, the region having a length and a width as shown in Figures 3 and 5; background diffractive structural elements (B, B') distributed over the length of the region, a plurality of the background elements having a longitudinal extent which extends throughout the width of the region as shown in Figures 3 and 5; and a plurality of interstitial diffractive structural elements (A, A'); the interstitial elements are interspersed between the background elements such that each of the plurality of interstitial elements are interspersed at least partially longitudinally alongside a background element, or

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alongside another interstitial element that extends alongside a background element, within the region or wherein at least some of the plurality of interstitial elements are smoothly connected to one or more of the background elements within the region as shown in Figure 5 whereby the diffractive action of the background elements is to modulated by the interstitial elements, with differing interstitial element configuration in differing parts of the surface relief structure producing differing diffraction effects in corresponding parts of the diffraction images as described in column 6, lines 29-55. It should be noted that the definition of interstitial is "related to or situated in the interstices," an interstice being "a space that intervenes between things," (i.e., situated in a space that intervenes between things). (See Merriam-Webster's Collegiate Dictionary, 10th ed., 1999) Therefore, it is clear that the diffractive structural element (A, A') meets the claimed recitation of an interstitial diffractive structural element.

Regarding claims 2 and 23, Yoshitake et al. discloses (see Figures 3, 5) that at least some of the background elements consist of a multiplicity of continuously connected individual ridge or groove segments, with ridge or groove segments in adjacent background elements being arranged in an approximately parallel configuration, and wherein at least some of the interstitial elements consist of individual or bifurcated ridge or groove segments interspersed between the background elements, with interstitial element ridge or groove segments being approximately parallel to ridge or groove segments in adjacent background elements as described in column 4, lines 1-5, column 7, lines 18-58 and as shown in Figure 5.

Regarding claim 3 and 24, Yoshitake et al. discloses (see Figures 3 and 5) that at least some of the background elements are approximately parallel, each consisting of a plurality of discontinuous individual ridge or groove segments, and wherein at least some of the interstitial elements are approximately parallel to each other, each consisting of one or more ridge or groove segments or each being located in a discontinuity in a background element as described column 7, lines 18-58 and as shown in Figures 3 and 5.

Regarding claim 4 and 25, Yoshitake et al. discloses that at least some of the interstitial elements are connected smoothly at each end to a background element as shown in Figure 5.

Regarding claim 5 and 26, Yoshitake et al. discloses that including additional interstitial elements oriented generally at right-angles to the general orientation of the background elements as shown in Figure 3.

Regarding claim 6 and 27, Yoshitake et al. discloses (see Figures 3 and 5) that at least some of the interstitial elements are connected smoothly to adjacent interstitial elements and/or background elements in one or more of the following ways:

(c) an interstitial element joins smoothly into a background element;

as described on column 3, lines 53-68, column 4, lines 1-13, column 7, lines 22-68 and column 8, lines 1-56.

Regarding claim 7 and 28, Yoshitake et al. discloses (see Figures 3 and 5) that at least some of the background elements are connected smoothly to adjacent background elements and/or interstitial elements in one or more of the following ways:

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(c) a background element joins smoothly into an interstitial element;
as described on column 3, lines 53-68, column 4, lines 1-13, column 7, lines 22-68 and column 8, lines 1-56 and as shown in Figures 3 and 5.

Regarding claim 8 and 29, Yoshitake et al. discloses (see Figures 3-5) that each of the background elements and the interstitial elements has a shape which includes one or more of the following features:

- (a) a straight, curved or undulating groove;
- (b) a straight, curved or undulating ridge;
- (c) an array of dot-shaped indentations or protrusions; or
- (d) a polygonally shaped indentation or protrusion

as described in column 4, lines 1-5 and column 7, lines 22-68 and column 8, lines 1-56.

Regarding claim 9 and 30, Yoshitake et al. discloses (see Figures 3-5) that the diffraction effects observed in a particular part of the image are determined by the interstitial element configuration in a corresponding part of the surface relief structure, and the interstitial element configuration features include one or more of the following features:

- (a) lengths of interstitial elements;
- (b) widths of interstitial elements;
- (c) depths and/or heights of interstitial elements;
- (d) local spatial frequency of interstitial elements;
- (e) degree of curvature of interstitial elements;
- (f) shape of interstitial elements; and

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(g) shapes of joins between adjacent interstitial elements

as described in column 7, lines 22-68 and column 8, lines 1-15.

Regarding claim 10 and 31, Yoshitake et al. discloses that between background elements interstitial elements vary continuously in terms of orientation, curvature, thickness and/or shape, the variations being a means by which image information is encoded into the surface relief structure as described in column 7, lines 22-68 and column 8, lines 1-15.

Regarding claim 12 and 33, Yoshitake et al. discloses (see Figure 3) that at least some or including additional interstitial elements (14) arranged in a comb-like configuration, with the teeth of the comb being oriented at right angles or at an angle oblique to the general orientation of the background elements (15) as shown in Figure 3.

Regarding claim 13 and 34, Yoshitake et al. discloses (see Figure 3) that at least some or additional interstitial elements are arranged in groups oriented at right angles or obliquely to the general orientation of the background elements, such that a cross-section through the group has a periodic or sinusoidal shape of many repeating periods or oscillations as described in column 6, lines 1-63 and column 7, lines 22-58 and as shown in Figure 3.

Regarding claim 14 and 35, Yoshitake et al. discloses that at least some interstitial element configurations are designed to create grey-scale or variable image intensity information in the image, and one or more of the following configuration features give rise to the grey-scale or variable image intensity information:

- (a) lengths of interstitial elements;
- (b) degree of curvature of interstitial elements;
- (c) widths of interstitial elements and shapes of joins between adjacent elements;
- (d) local slope or angle of interstitial elements

as described in column 4, lines 11-13, column 7, lines 22-67 and column 8, lines 1-15.

Regarding claim 15 and 36, Yoshitake et al. discloses that at least some interstitial element configurations are designed to create colour information in the image as described in column 4, lines 4-10, column 8, lines 10-16, 57-63.

Regarding claim 16 and 37, Yoshitake et al. discloses (see Figures 3 and 5) that the background elements include one or more of the following configurations:

- (a) straight, equally spaced background elements;
- (b) straight, variably spaced background elements;
- (c) undulating, equally spaced background elements;
- (d) undulating, variably spaced background elements;

as shown in Figures 3 and 5.

Regarding claim 17 and 38, Yoshitake et al. discloses that the surface relief structure generates two or more diffraction images which are observable from different ranges of viewing angles, wherein some regions of the surface relief structure contribute to one of the images, and other regions contribute to another of the images as described in column 6, lines 9-63.

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Regarding claim 18 and 39, Yoshitake et al discloses that at least some of the interstitial elements have lengths of less than 0.25mm as described in column 10, lines 1-15.

Regarding claim 19 and 40, Yoshitake et al discloses that the background elements have lengths of greater than 0.25mm as described in column 10, lines 1-15.

Regarding claim 20 and 41, Yoshitake et al. discloses that the surface relief structure includes between background elements one or more of the following:
(b) interstitial elements consisting of parallelograms of varying angular orientations indented into the surface relief structure; (c) diffusely reflecting randomly distributed interstitial elements; (d) diffusely reflecting trapezoidal interstitial elements as described in column 4, lines 1-5 and column 8, lines 36-56.

Regarding claim 32, Yoshitake et al. discloses that at least some of the interstitial elements are oriented generally parallel to the background elements as shown in Figure 5.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 21 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshitake et al U.S. Patent 5,991,078 in view of Staub et al U.S. Patent 6,359,734.

Regarding claims 21 and 42, Yoshitake teaches the invention as set forth above but does not teach that machine-readable digital information is encoded into the positioning, length, orientation and/or other physical characteristics of interstitial elements, such that the information may be read by passing a laser over the interstitial elements and analysing and decoding the reflected light.

Regarding claims 21 and 42, Staub et al does teach that machine-readable digital information is encoded into the positioning, length, orientation and/or other physical characteristics of interstitial elements, such that the information may be read by passing a laser over the interstitial elements and analysing and decoding the reflected light as described in column 5, lines 16-67 and column 6, lines 1-14.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to encode machine-readable information into the positioning, length, orientation and/or other physical characteristics of diffractive elements as taught by Staub et al in the diffractive device of Yoshitake et al in order to provide for additional security features for authenticity purposes.

Response to Arguments

5. Applicant's arguments filed 08 September 2003 have been fully considered but they are not persuasive.

The Applicant argues that in the prior art, *Yoshitake*, the interstitial gratings A or A' are not interspersed between the background elements B or B' "such that each of the ... interstitial elements extends at least partially longitudinally alongside a background element" as is now recited in claims 1 and 22. Further, the applicant maintains that the

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grating A or A' is distinctly different grating compared to the background grating B or B' and therefore there is no disclosure to support an interpretation that a background grating B or B' extends into and between an area containing the interstitial gratings A or A'.

In response to this argument, the Examiner would like to point out that the claim rejection is based upon the claim recitation. The definition of "intersperse" is to "place something at intervals or among" or "to insert at intervals among other things." (Merriam-Webster's Collegiate Dictionary, 10th ed., 1999) Figures 3 and 5 of *Yoshitake* clearly show a plurality of interstitial elements (A or A') wherein the interstitial elements are interspersed between the background elements (B or B') as defined above. Furthermore, the plurality of interstitial elements extends at least partially longitudinally alongside a background element as shown in Figures 3 and 5. The claim does not recite that a background grating extends into and between an area containing the interstitial gratings but merely that the interstitial elements are interspersed (i.e., "inserted at intervals among other things") between the background elements and the broadest reasonable interpretation of Figures 3 and 5 of *Yoshitake* would support that interpretation.

The Applicant further argues that *Yoshitake* does not read on the limitation that some of the plurality of interstitial elements are smoothly connected to one or more of the background elements. The Applicant maintains that the fact that some of the schematic lines representing diffraction grooves B' drawn on Figure 5 meet with some of the schematic lines representing diffraction grooves A', such that a line representing

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an A' groove appears to be a continuation of a line representing a B' groove is merely happenstance and not a disclosure that a groove B' extends into an area of A' grooves or that a background groove B' is smoothly connected to an interstitial groove A'.

Furthermore, the applicant argues that the fact that the A or A' and B or B' gratings are quite different together with the fact that the A, A' gratings are contained in a "cut out" area of the background B, B' grating leads to an interpretation that the transition between the B' and A' gratings is sharp and thus a smooth connection between the two would not exist.

In response to this argument, the Examiner would like to point out that drawings or pictures can anticipate claims if they clearly show the structure which is claimed. *In re Marz*, 455 F.2d 1069, 173 USPQ 25 (CCPA 1972). Figure 5 of *Yoshitake* clearly shows that some of the interstitial elements A' smoothly connect to one or more background elements B'. Furthermore, it does not matter that the feature shown is unintended or unexplained in the specification. The drawings must be evaluated for what they reasonably disclose and suggest to one of ordinary skill in the art. *In re Aslanian*, 590 F.2d 911, 200 USPQ 500 (CCPA 1979). Furthermore, that the gratings A, A' and B, B' gratings are quite different together does not negate the interpretation of the A, A' and B, B' diffractive structural elements as reading on the claims as currently recited. In regard to the assertion that the A, A' gratings are contained in a "cut out" area of the background B, B' grating which leads to an interpretation that the transition between the B' and A' gratings is sharp and thus a smooth connection between the two would not exist, the Examiner would like to point out that the "cut out" approach does

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not preclude a reading with the broadest reasonable interpretation of at least some of the plurality of interstitial elements smoothly connected to one or more background elements as shown in Figure 5. Furthermore, the "cut out" approach is but one of the many ways that these diffractive structural elements can be formed. *Yoshitake*, also describes (in column 6, lines 64-68 and column 7, lines 1-10 and column 11, lines 23-46), a method utilizing electron or ion beam lithography to create the diffractive structural elements.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Stork US Patent 6,271,967 shows a diffractive device having a surface relief structure including a region of diffractive structural elements (8, 30) background diffractive structural elements (10, 14, 32), a plurality of interstitial diffractive

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structural elements (12, 34) wherein the interstitial elements are interspersed between the background elements as shown in Figures 2 and 3.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (703) 305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava 
19 November 2003


MARK A. ROBINSON
PRIMARY EXAMINER